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THE WESTERN GAS CONSTRUCTION COMPANY

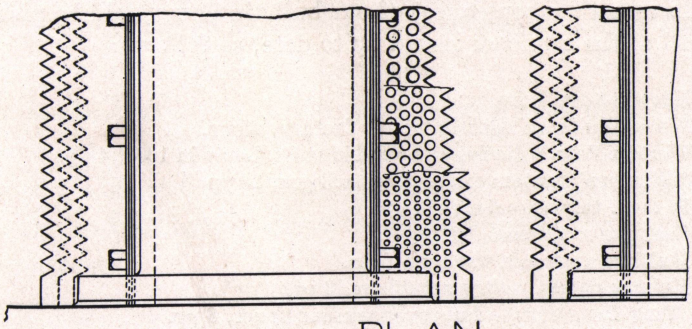
GAS ENGINEERS AND BUILDERS

SAN FRANCISCO FORT WAYNE, IND. NEW YORK

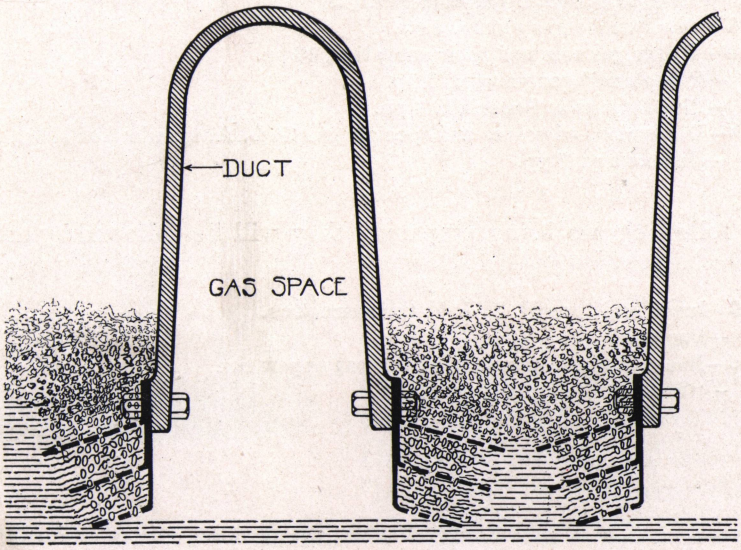
BULLETIN No. 202-B

IMPROVED WASHER BOXES

For use with Coal Gas, Water Gas or Oil Gas



PLAN



SECTIONAL ELEVATION

(PATENT PENDING)

THIS IS THE DUCT THAT DOES THE BUSINESS

This Bulletin contains a brief description of how this design was developed,—a design that cannot be excelled for high capacity and thorough washing effect.

The Western Gas Construction Company

If you have not a complete set of our bulletins, we would be pleased to send you any or all of the numbers issued up to date, as follows:

Introductory, 6 pp.
Works Bulletin, describing our factory, 28 pp.
World's Fair Bulletin, our exhibit at St. Louis in 1904, 4 pp.
201 —"Western" system of treating coal gas, 20 pp.
201A—P. & A. tar extractors, 12 pp.
201B—Coal gas condensers, 20 pp.
202 —Multiple ammonia washers, 8 pp.
202A—Holmes patent rotary scrubbers, 8 pp.
202B—(THIS BULLETIN)—Improved washer boxes, 8 pp.
203 —Ammonia stills and concentrators, 14 pp.
210 —"Western" water gas apparatus, 20 pp.
210A—Small water gas plants, 4 pp.
210B—Water gas sets and their operation, 16 pp.
220 —"Western" gas valves, 20 pp.
221 —Pipe fittings and specials, 6 pp.
221A—Dimensions of valves and specials (A. G. L. A. standard of 1905), 2 pp.
240 —Gas holders, 8 pp.

The following are being prepared; they will be followed by others in the future:

201C—Inner seal type of P. & A. tar extractors.
204 —Purifiers.
210C—Recent improvements in water gas apparatus.
230 —"Western" oil gas apparatus.

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TROUBLES

It is well recognized that frequently trouble occurs in the use of washer boxes from the impurities contained in the water or from the presence of lamp black, napthalene or heavy tar in the gas, resulting in stoppages, loss of efficiency, reduced capacity and back pressure. The delay and expense of properly cleaning the ordinary forms of washers contributes to their habitual poor condition.

Now it is admitted that it is essential in washer construction to thoroughly subdivide the streams of gas into bubbles or "foam" to secure intimate contact with the water. The problem of securing intimate contact, eliminating back pressure troubles and permitting easy and repaid cleaning was a serious one for the designer to meet.

Trying Out the New Design

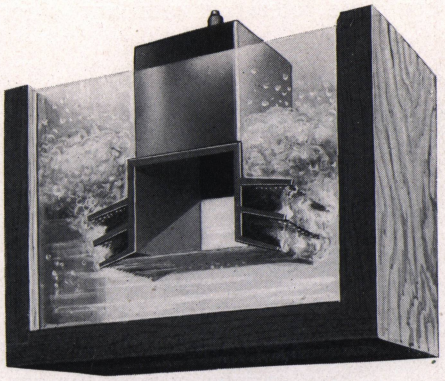

FIG. 1

Not satisfied with a design that seemed theoretically correct, we made a practical test of a model inside of a box with glass sides. Fig. 1. The operating pressure is only enough to depress the water slightly below the first row of holes in the bottom screen. Our tests showed clearly the following points: (a) The air (used for the test) issued from each hole as a stream of bubbles. (b) These streams did not tend to "blow out" and bypass the screen above, but rather tended to hug the side of the ducts. (c) The streams of bubbles, impinging on the underside of the next screen above formed a gas pocket, or collecting space. *This feature ensures a redistribution of the gas particles before the next set of bubble-streams is formed.* (d) The "foamy" effect produced at the top gave evidence of most efficient washing, the gas particles being thoroughly mixed with the films of water.

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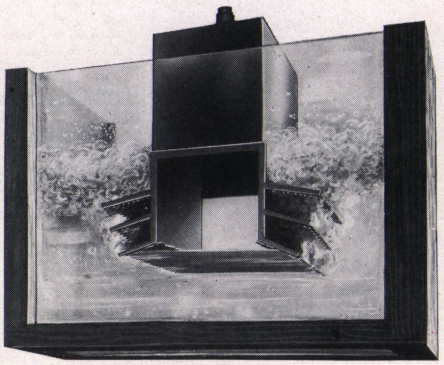

FIG. 2

The first series of tests satisfied clearly the requirement of intimate contact. Following this naturally came the study of the effect of stoppages. Before the photograph for Fig. 2 was taken, we placed sheets of paper under the bottom screens, compelling all the air to go under and pass through the serrated edges (see page one). We were much pleased to see the streams of gas return inward, being caught by the overhanging screen above and complete the usual action in the middle and upper screens.

The contact secured through the serrated edges of the stopped-up bottom screen is the equivalent of the washing effect of other competitive designs; to this is added the multiple effect of the upper screens.

At least three times the length of time between periods of cleaning out is permissible with our new design than could be tolerated with any other washer, *if efficient washing is demanded.*

The Completed Washer

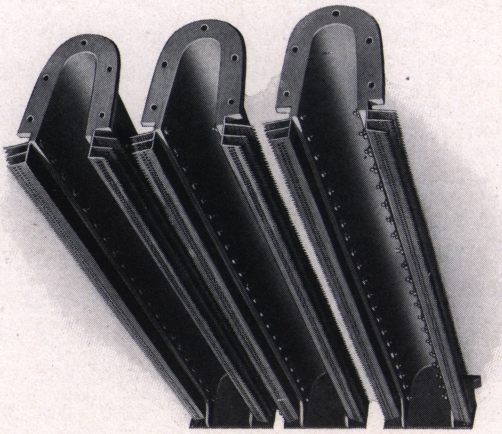

FIG. 3

A set of ducts with screens attached is shown in Fig. 3. The ducts are arranged with eye-bolts in each end and are carried on ledges inside the box, requiring only the unbolting of the inlet ends to permit hoisting out the entire duct. As a rule, the stoppages come from cold tar or napthalene, and the screens can be readily steamed out without hoisting out the ducts, using only a piece of bent pipe for a nozzle.

High Capacity

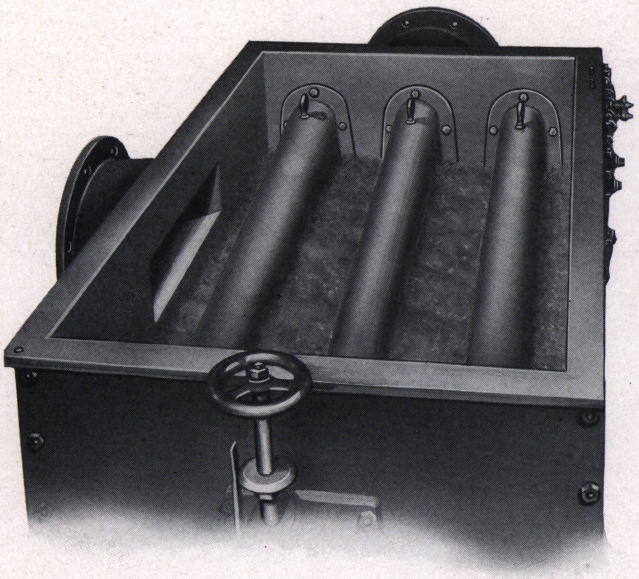

FIG. 4

The capacity of our improved washers is *not an estimate*, but the result of carefully conducted tests.

The tests were made with air and the results corrected for the specific gravities of water gas and coal gas. At the conclusion of these tests, the cover of the box was removed, air was blown through, and the surface of the water was seen beaten into a heavy foam, uniformly in all parts of the washer, as shown in Fig. 4. Another view of this foamy condition of the water is shown in Fig. 1, where the model washer was operated under only a light load.

Use with Oil Gas

Removing lampblack from oil gas can be appreciated only by those who have had the experience. However, the 8,000,000 cubic feet per day washer on the next page is handling oil gas with entire satisfaction.

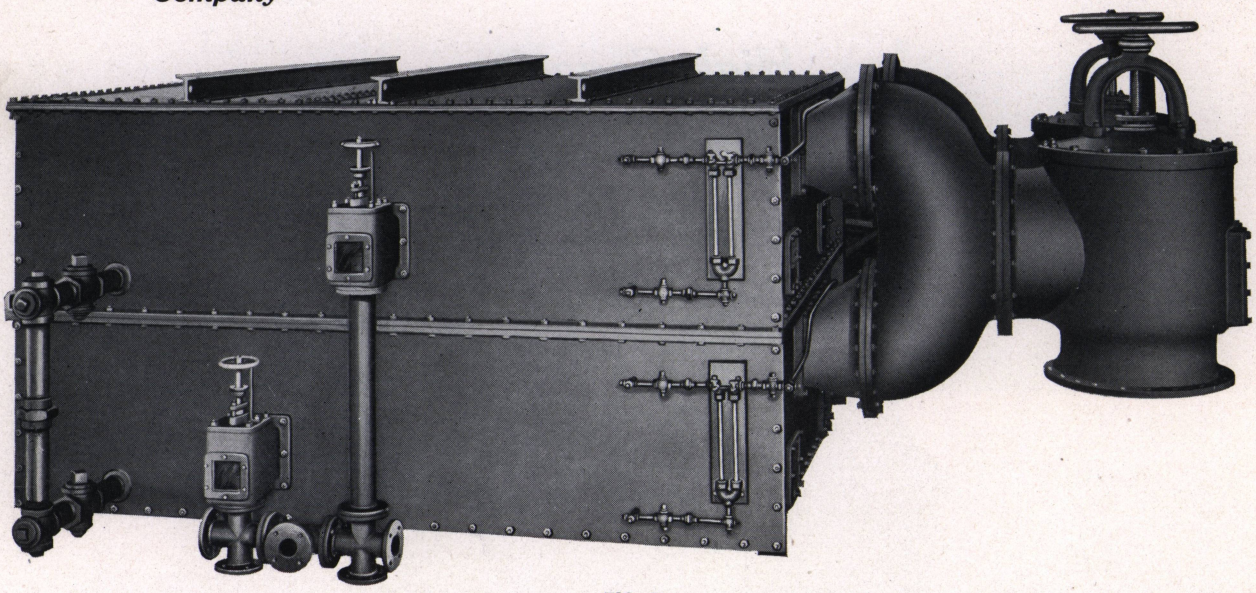

FIG. 5

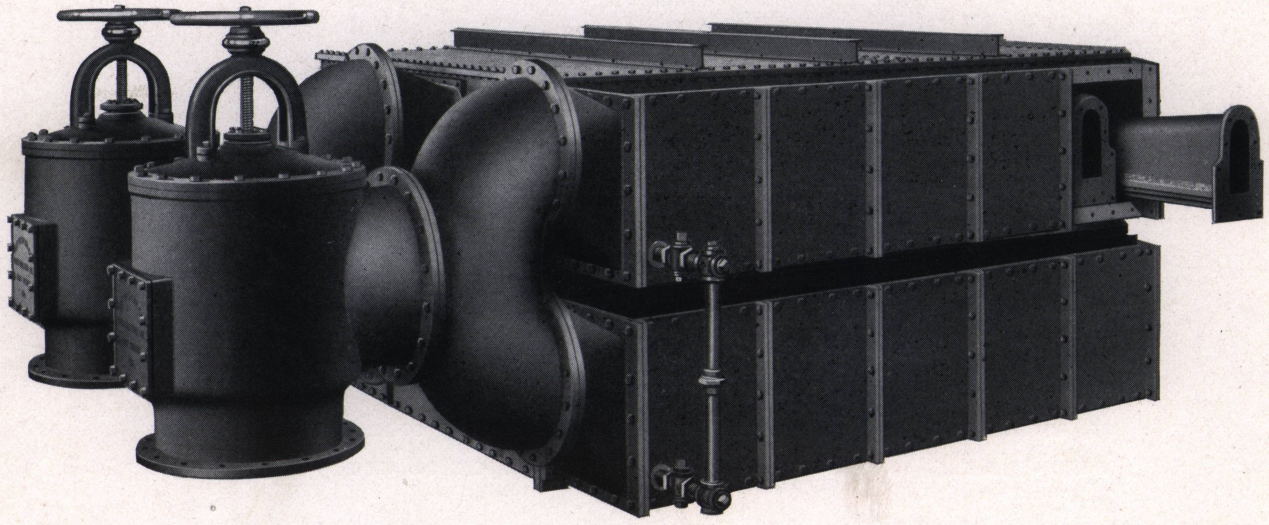

FIG. 6

Fig. 5 above shows the outlet header and valve, the differential gauges, adjustable sight overflow- and drain connections arranged to give independent adjustment of height of water and differential press sure for each "deck."

Fig. 6 shows the inlet header and valve and the arrangement for withdrawing a duct (inner end sliding out on a tee-rail) without taking off the cover, an indispensable feature on a "double-deck" box.

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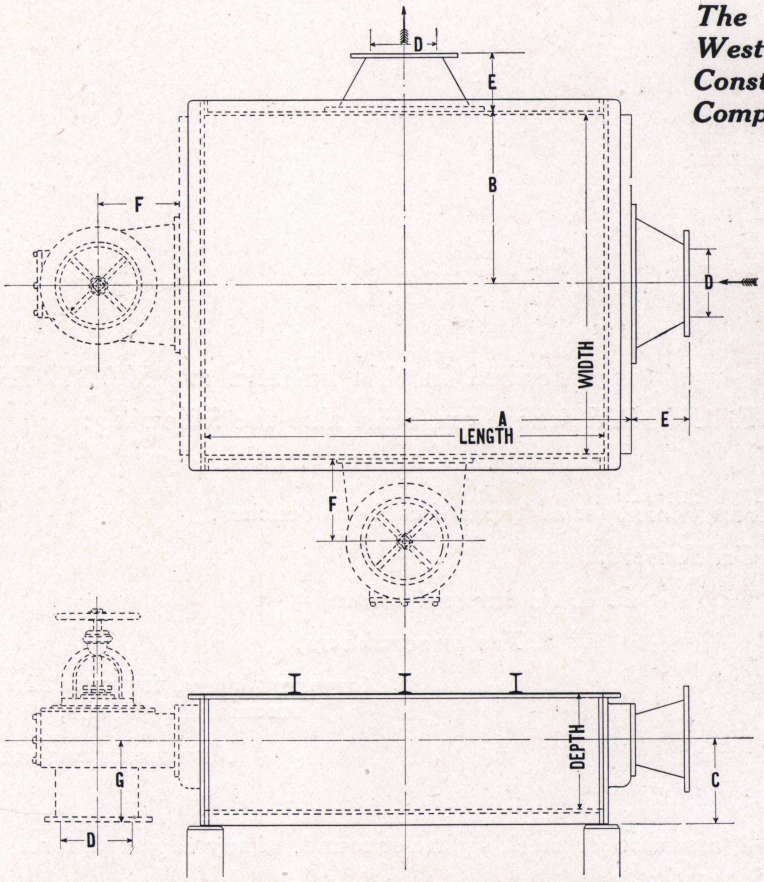
INLET

May be at either end; the adjustable overflow (not shown here) will be at the opposite end.



OUTLET

May be at either side; a manhole (not shown here) will be located in the opposite side.

CAPACITIES AND DIMENSIONS

SIZE WASHER			DAILY CAPACITY	DIMENSIONS OF WASHERS			DIMENSIONS OF CONNECTIONS			
WIDTH (INLET SIDE)	LENGTH (OUTLET SIDE)	DEPTH		A CENTER TO INLET OPENING	B CENTER TO OUTLET OPENING	C FROM TOP OF FOUND'N	D SIZE OF OPENING	E LENGTH SPECIAL NOZZLE	CENTER-TO-FACE OF SPECIAL ANGLE VALVES F	CENTER-TO-FACE OF SPECIAL ANGLE VALVES G
2'-0"	3'-0"	2'-0"	300000	22¾"	12¾"	19¾"	8"	7 "	8¾"	8¾"
3'-0"	3'-0"	2'-0"	450000	22¾"	18¾"	18¾"	10"	7¾"	10¾"	10¾"
3'-0"	4'-0"	2'-0"	600000	2'- 4¾"	18¾"	18¾"	12"	8⅝"	12¾"	12¾"
3'-0"	5'-0"	2'-0"	750000	2'-10¾"	18¾"	18¾"	12"	8⅝"	12¾"	12¾"
3'-0"	7'-0"	2'-0"	1050000	3'-10¾"	18¾"	17½"	16"	14⅜"	16¾"	16¾"
5'-0"	7'-0"	2'-0"	1750000	3'-10¾"	2'-6¾"	17 "	20"	16¼"	20¾"	20¾"
6'-0"	7'-0"	2'-0"	2100000	3'-10¾"	3'-0¾"	17 "	20"	16¼"	20¾"	20¾"
10'-0"	7'-0"	2'-0"	3500000	3'-10¾"	5'-0¾"	14¼"	24"	8¼"	22 "	22 "
12'-0"	7'-0"	2'-0"	4200000	3'-10¾"	6'-0¾"	14¼"	24"	8¼"	22 "	22 "
8'-0"	7'-0"	5'-6"	5600000	**Dimensions of these "Double-Deck" Washers furnished on application.**						
8'-0"	10'-0"	5'-6"	8000000							

NOTE:—"D" may be smaller than shown in table, when E, F, and G will vary accordingly.

The
Western Gas
Construction
Company

The washers described in this bulletin are MADE IN OUR OWN FACTORY, where are built also the following:

Bench Iron Work, for all types of coal gas benches,

Condensers,

P. & A. tar extractors,

Tower scrubbers,

Rotary scrubbers, for extraction of ammonia or light oils,

Ammonia concentrators.

Purifiers, cast iron or steel, square or round, of any capacity, for any system of operation.

Holders with steel tanks or for masonry tanks, any capacity up to 1,125,000 cu. ft. Special, heavy holders built to give any pressure desired.

Water Gas Sets of capacities from 60,000 to 3,600,000 cu. ft. per day, with all auxiliary parts.

Oil Gas Sets of capacities from 70,000 to 1,300,000 cu. ft. per day, with special auxiliary parts.

Valves—Specials—Tanks—Structural steel work of all kinds

"EVERYTHING FOR A GAS PLANT"